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ABSTRACT

This study tested the hypothesis that social competence of mother-infant play reflects both secure mother-infant attachment and more advanced cognitive development. Subjects were 58 toddlers between 16 and 19 months of age and their mothers. Two general methods were used: observation and maternal report. Standardized developmental assessments were used to ascertain toddlers' cognitive abilities. Suggesting that cognitive and social influences on the development of play are not parallel, findings indicated that the toddlers' shift in attention from dropped object to mother was related not to security but to cognitive development. Organization of attention during play was related to the play context that the infant created by dropping toys from the high chair tray. The shift in attention to the mother showed that the toddler's goal in the game was getting the mother to respond. The infants who were more securely attached were more likely to attain their goal. Their mothers responded by returning the toys more quickly. Perhaps because the more secure toddlers were more certain of their mothers' responsiveness they were less likely to use their object play to test it. They played with the toys longer before dropping them and paid more attention to the toys than did the less secure toddlers. The organizatiion of attention in toy-mother-toy sequences, particularly the likelihood of attention to toys being embedded in such sequences, was associated primarily with cognitive ability. (RH)

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Toddler Play in Relation to Social and Cognitive Competence [1]

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"Play" is the term used to refer to intrinsically motivated, self-initiated behavior. Developmental theorists have suggested that play provides essential experiences for individual development (Bruner, 1972). Indeed, research has shown that play contributes to early cognitive and social development (see Rubin, Fein, & Vandenberg, 1983 for review). Play begins in the early months of infancy and changes dramatically with age, but the factors influencing those changes are not well understood (Belsky & Most, 1981; Crawley et al., 1978; Crawley & Sherrod, 1984). The earliest play is almost entirely social, but as infants develop skills for manipulating objects, toy play becomes predominant.

Around the end of the first year, social and toy play become increasingly integrated and infants become capable of playing with both an object and a person. Why does play change at this age? The theoretical model of play used for the proposed research integrates developmental theories, which explain play in relation to emerging abilities (e.g., Belsky & Most, 1981), and motivation theories of play, which explain play in relation to mastery (e.g., White, 1959; Piaget, 1962). According to this integrated theory of infant play, the motivation for play is to maintain a moderate level of challenge. Then, as abilities improve, play changes so that the thrill of mastery can continue to be experienced (Roggman, 1987,1989). Therefore play behavior changes because the specific goals of play change with development.

One example of developmental change in the goals of infant play is evident in the game of peek-a-boo that can be played as a sensory game, a cognitive game, or social game at varying points in development (Bruner & Sherwood, 1976; Hodapp & Goldfield, 1985; Kleeman, 1973). Sequences of behavior have been used in research to interpret the goals of the peek-a-boo game and may be useful for interpreting the goals of other kinds of play as well. One indication of the goal of play is the

organization of attention. Recent studies showed that infants do indeed organize their attention in play differently at different ages. For example, after dropping a toy, 10-month-olds are more likely to look at the toy, but 15-month-olds are more likely to look at the mother indicating different goals for dropping the toy (Roggman, 1987). In another study, 15-month-olds were found to be more likely than 10-month-olds to organize their attention to toys and mother in a toy-mother-toy sequence, an indication of the integration of social and cognitive goals in play (Roggman, 1989). These age differences represent an important shift in infant social competence that is likely to be influenced by individual differences in both cognitive and social domains.

Cognitive development is likely to contribute directly to the child's understanding of means-ends relations in a social context and ability to coordinate attention with another person. Around the beginning of the second year, the emerging ability of instrumental social interaction begins to be expressed in social play, as for example when a toddler uses social interaction as a way of getting help with a difficult toy (Rogoff, Mistry, Radziszewska, & Germond, in press). As infants become cognitively able to understand means-end relations, they begin to use that understanding in a social context, not only to use persons to help them with objects but also to use objects to help them with persons (McCall, Eichorn, & Hogarty, 1977). For example, an infant may begin to use actions with a toy to initiate social interactions that include coordinated social attention to objects (Crawley & Sherrod, 1984). The understanding of means-end relations and the ability to coordinate social and object attention require the cognitive skills that are emerging early in the second year (Belsky & Most, 1981; McCall, 1979; McCall et al., 1977; Rogoff, et al., in press).

The infant's social relationship with the caregiver, or primary attachment, is also likely to affect a child's motivation for integrating social and object play. The

infant's use of objects to initiate interaction is one aspect of "distal contact seeking" typically used in the assessment of secure attachment (Ainsworth, Blehar, Waters, & Wall,1978). Indeed, recent research indicates that an infant assessed as securely attached is more likely to look at the same object as his or her mother and to share objects with her (Roggman, et al., 1987; Waters, Wippman, & Sroufe, 1978). These behaviors, showing coordination of social and object related play behavior, have been proposed as indicators of the quality or developmental level of mother-infant play (Belsky, Goode, & Most, 1980; Crawley & Sherrod, 1984; Roggman, Langlois, & Hubbs-Tait, 1987). To the extent that attachment reflects the general quality of the mother-infant relationship (Ainsworth et al., 1978; Sroufe & Waters, 1977) or the social competence of the infant (Waters & Sroufe, 1983), the security of infant attachment is likely to be correlated with infant behavior in nonstressful play situations. Individual differences in play behaviors, then, may provide evidence of an infant's level of social competence.

Early in the second year, infants begin to incorporate their new cognitive and social abilities in play as a means of making contact with their attachment figure. However, the cognitive and social influences may not be parallel. Certain aspects of the coordination of social and object play may require more cognitive ability than others, and certain aspects may be more affected than others by the quality of the relationship between the playmates, in this case the mother and child. The purpose of this study was to explore several measures of infant social competence evident in social-toy play in relation to security of attachment and cognitive ability. If specific play behaviors observed in typical nonstressful situations are correlated with attachment, then such behaviors may be used for assessing psychological functioning in the early years as alternative measures to the stressful Strange Situation and complicated

Q-sort now in use (Ainsworth et al., 1978; Waters & Deane, 1985). Furthermore, exploration of the specific social and cognitive correlates of play behavior may reveal factors that contribute to the development of play.

This study tested the hypothesis that social competence of mother-infant play reflects both secure mother-infant attachment and more advanced cognitive development. The targeted age range was from 16 to 19 months, when primary attachments have been formed and the integration of social and object play is considered an indication of social competence. Measures of the organization of attention during play, an indication of social competence in infancy, were tested in relation to security of mother-infant attachment and in relation to performance on developmental tasks reflecting cognitive competence.

METHOD

Subjects included 58 toddlers, age 16 to 19 months, and their mothers. Subjects were recruited by sending letters to parents of infants whose births had been announced in local newspapers. Families were then contacted by phone, told about the purpose and procedures of the study and invited to participate. Written informed consent was obtained from parents.

Two general methods were used: observation (both descriptive and experimental) and maternal report (using the Q-sort instrument). In addition, a standardized developmental assessment was used to assess each toddler's cognitive abilities. During the direct observation session, infants were seated in a high chair with 3 nesting cups on the tray and observed for 10 minutes. Mothers were seated in a chair less than 2 feet away and asked to complete background information questionnaires. The questionnaires served a dual purpose both to collect relevant data and to distract the mother's attention from the infant in a way that is not unfamiliar

in a typical infant's life: Mother is working while baby plays. This maximized the probability of the infant initiating contact and attempting to engage the mother in play. During the highchair observation, infants could "self-select" three play contexts by dropping toys: all toys on tray, toys on tray and on floor, or all toys on floor. Mothers were told not to pick up the toys unless all 3 were dropped. An additional 10 minutes of free play was also videotaped.

Organization of attention during toy play was measured by observation of infant attention before and after dropping a toy and attention to mother embedded in toy-mother-toy sequences. Trained observers recorded selected behaviors by using a keyboard connected to a Macintosh II computer system keeping a cumulative behavioral event record. A subset of videotapes were coded by two observers to assess both agreement and reliability (Hunter & Koopman, 1990). The following behaviors were recorded from the highchair session: Infant visual attention to toys (Frequency: mean *Kappa* = .89, mean intraclass *r* = .92; Duration: mean *Kappa* = .92, mean intraclass *r* = .95) and to mother (Frequency: *Kappa* = .91, intraclass *r* = .88; Duration: *Kappa* = .87, intraclass *r* = .78) and infant dropping of toys (Frequency: mean *Kappa* = .94, mean intraclass *r* = .90; Latency: mean *Kappa* = .93, mean intraclass *r* = .96). In addition, the duration of delay before mothers' return of the toys was measured as an inverse indication of maternal responsiveness, an expected predictor of attachment security (*Kappa* = .95; intraclass *r* = .99).

Standardized methods were used for assessing security and cognitive development. The security of mother-infant attachment was assessed using a Q-sort method (Waters & Deane, 1985). A list of 90 statements describing attachment-related behavior were mailed to the mothers to use for rating their child during the week before the laboratory observation. At the laboratory, mothers sorted 90 Q-sort cards

with the same statements into 9 piles ranging from "very much unlike my child" to "very much like my child," giving the card items numerical ratings. To derive a security score, the numerical ratings were then correlated with a set of criterion security ratings with an alpha reliability of .96. An observer who was unacquainted with the child viewed the videotaped play sessions and performed a Q-sort to derive independent security scores on 12 subjects (Pearson r = .81, intraclass r = .71). The security scores derived from the mother's Q-sorts ranged from .00 to .65 (typical of the range in similar studies), with a median of .33 and a mean of .34.

To assess of the cognitive developmental level of the infant, experimenters administered age-appropriate items from the Mental Scale of the Bayley Scales of Infant Development. Experimenters were trained to use standardized procedures for administering this assessment of cognitive abilities. Experimenters were videotaped and checked for accuracy and reliability in their scoring (mean *Kappa* = .86; intraclass r = .95).

RESULTS

The toddlers in this study behaved very much like toddlers in previous research (Roggman, 1987). After dropping a toy, but while there was still at least one toy on the tray, toddlers typically shifted attention away from the toys (from 66% to 52% of the time; *paired-t* (44) = 4.22, p = .003) and toward their mothers (from 17% to 31% of the time; *paired-t* (22) = -4.12, p = .004). This change in the focus of attention indicated that the "dropping game" had social goals in this age group.

Mothers had been instructed that after the infants dropped all 3 of their toys, the mother could then pick up the toys and put them back on the high chair tray. But mothers varied widely in how quickly they returned the toys to the infant after all the toys had been dropped. As predicted, the mothers of securely-attached infants were

more responsive, as indicated by a shorter delay before returning the toys to the tray (r = -.35, p = .007).

It was also expected that infants who had higher security scores would play differently than those with lower security scores. The infants with higher security scores were likely to play with the toys for longer periods before dropping all of them (r = .37, p = .004) and to spend more time looking at the toys (r = .31, p = .02). Infants with higher security scores were also more likely to organize their attention to their mothers in a toy-mother-toy sequence (r = .23, p = .08).

By using the Bayley test items we were able to test developmental differences directly instead of by merely comparing chronological age as had been done in previous studies. Indeed, in spite of the 3-month age range of subjects in this study, age was not correlated with any of the play variables, but the Bayley scores were. The results indicated that more advanced cognitive development was correlated with more attention to mother after dropping a toy (r = .38, p = .01) and with less attention to the dropped toy (r = -.31, p = .04). Bayley scores also predicted the the amount of attention to toy that was organized in toy-mother-toy sequences (r = .35, p = .008) and the frequency of those sequences (r = .32, p = .01).

DISCUSSION

The toddlers in this study showed clear evidence of being able to coordinate their social attention in relation to their object behaviors. Specifically, the organization of attention during play was related to the play context that the infant created by dropping toys from the highchair tray. The shift in attention to the mother shows that the toddler's goal in this game was getting the mother to respond. The infants who were more securely attached were more likely to attain their goal: Their mothers responded by returning the toys more quickly. Earlier research has found maternal

responsiveness in caregiving to be a significant predictor of secure attachment (Ainsworth et al., 1979). The results here show that the mother's responsiveness in a play context is also indicative of security.

Perhaps because the more secure toddlers were more certain of their mothers' responsiveness they were less likely to use their object play to test it. Rather, they played with the toys longer before dropping them and paid more attention to the toys than the less secure toddlers did. What these results show is that the motivation for play in toddlers is related to the mother-child relationship. Those infants who have formed a secure attachment relationship with their mothers remain engaged in toy play, with mother nearby, for longer periods of time and they are also somewhat more likely to integrate toy play with attention to their mother. What the securely-attached infant appears to be doing then, is playing with toys while making periodic visual contact with the mother between looks to the toys. These findings are consistent with theoretical constructs of secure attachment as a support for exploration of the object environment (Sroufe & Waters, 1977) but suggest specific mechanisms of that support.

It was also predicted that securely-attached infants would be more likely to shift their attention to the mother after dropping a toy. However this shift was not correlated with security, but rather was related to the cognitive development of the infant as measured by a standardized developmental assessment. Those infants who performed at a more advanced cognitive level were those who were most likely to reorganize their attention after dropping a toy to focus more on the mother and less on the dropped toy. This shift in focus to the caregiver indicated that the toddlers were less interested in the effect of dropping on the object than in the possibility of involving the caregiver in interactions with the object. More complex social-toy play goals are thus related to more advanced cognitive development. This further explicates

previous findings of the same shift across age groups toward more complex social goals for this "game" (Roggman, 1987, 1989).

The organization of attention in toy-mother-toy sequence, particularly the likelihood of toy attention being embedded in such sequences, was associated primarily with cognitive ability. The coordination of attention to persons and objects thus appears to require cognitive abilities that are emerging at this age. Coordination of attention is evidently also facilitated by security of attachment which was a predictor, albeit a weak one, of the attention to mother in toy-mother-toy sequences.

This research makes contributions to our understanding of both attachment and play. Because security of mother-infant attachment is correlated with measures of competence in play, the construct of attachment is further extended and validated. The relation of attachment to toy play and coordinated attention provides evidence that attachment is indeed a reflection of a supportive mother-infant relationship and that this relationship is likely to facilitate the infant's development in several ways. The correlations found in this study between security and measures of the organization of behavior in mother-infant social-toy play were of only moderate magnitude. Nevertheless, the findings do offer direction for further exploration for using play as an alternative method for assessing psychological functioning in the early years.

Finally, these results suggest that cognitive and social influences on the development of play are not parallel. The duration of toy play was related to security but not to cognitive abilities, and the social use of objects was related to cognitive abilities but not to security. The coordination of attention was predicted by both cognitive abilities and security of attachment, however, but in different ways. Cognitive abilities supported the integration of object attention into toy-mother-toy sequences, and security supported the integration of social attention into such sequences.

Despite theoretical suggestions that play is essential for normal human development, we still know very little about the development of play itself. This study reveals distinct cognitive and social contributions to the development of play and thus contributes to our growing understanding of the developmental course and differential influences on early social-toy play.

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